

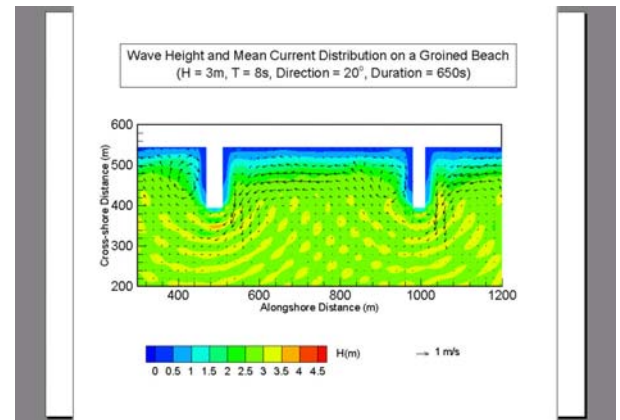


US Army Corps  
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# Boussinesq Wave Modeling for Structures, Harbors and Inlets

## Description

BOUSS-2D is a comprehensive numerical model for simulating the propagation and transformation of waves in coastal regions and harbors based on a time-domain solution of Boussinesq-type equations. The governing equations are uniformly valid from deep to shallow water and can simulate most of the phenomena of interest in the nearshore zone and harbor basins including shoaling/refraction over variable topography, reflection/diffraction near structures, energy dissipation due to wave breaking and bottom friction, cross-spectral energy transfer due to nonlinear wave-wave interactions, breaking-induced longshore and rip currents, wave-current interaction and wave interaction with porous structures. Many processes at inlets and harbors can be studied using BOUSS-2D.



2D map of mean currents generated using the BOUSS-2D model

## Benefits

**BOUSS-2D** can be applied to a wide variety of coastal and ocean engineering problems, including complex wave transformation over small coastal regions (1-5 km), wave agitation and harbor resonance studies, wave breaking over submerged obstacles, breaking-induced nearshore circulation patterns, wave-current interaction near tidal inlets, infra-gravity wave generation by groups of short waves, and wave transformation around artificial islands.

## Documentation and Support

BOUSS-2D: A Boussinesq Wave Model for Coastal Regions and Harbors, ERDC/CHL TR-01-25.

## Application

Recent applications of the model include nearshore wave climate studies Ponce de Leon Inlet, Florida, wave agitation studies for Barbers Point Harbor, Kahului Harbor, and Kawaihae Harbor in Hawaii, wave effects in Brookings Harbor, Oregon, and wave-induced circulation and shoreline erosion studies at the Saco Bay, Maine.

## Point of Contact

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